REMARKS/ARGUMENTS

This is a reply to the Non-Final Office Action dated October 1, 2008.

Status of Claims

Claims 1-18 are currently pending in this application.

Claims 1-4 have been withdrawn.

Claims 17 and 18 are added.

Claims 5 and 6 are currently amended.

No claim is canceled.

Support for Amendments and New Claims

Claims 5 and 6 are amended based on support provided at page 8, lines 17-24, and elsewhere in the present application.

Claims 17 and 18 are supported at page 8, lines 17-24 of the present application. Claims 17 and 18 are drawn to the previously elected invention.

No new matter has been introduced by this amendment.

Interview Summary

The applicant's undersigned representative conducted an in-person interview at the US PTO with Examiners Jennifer Steele and Elizabeth Cole on December 4, 2008. Claims 5-16 were discussed. The applicants' representative provided and discussed copies of trade literature on lyocell and viscose rayon. The applicants' representative discussed that the structurally-stable hydroentangled flame retardant, nonwoven fabric of the present invention has a two layer construction wherein one layer is a fiber blend of lyocell and modacrylic fibers that chars instead of melts, and the directly adjacent second layer is a fiber blend of lyocell, modacrylic, and also para-amid fibers which impart structurally stable integrity to the composite structure when burned while the first layer fiber masks discoloration of the second layer associated with para-amid fiber present therein. The applicants' representative discussed that Mater et al. teaches Visil® type viscose rayon, which has a large inorganic content, and neither Visil® or even viscose rayon itself is the same as lyocell as detailed in the trade literature. The Examiner

indicated that Rearick was relied upon for teaching that lyocell would be a known substitute for cotton of Mater. The applicants' representative also discussed that Rearick requires FR topical treated cellulosic fibers, and that the cotton fiber and listed fibers in claim 8 thereof refer to FR treated fibers. The applicants' representative also pointed out that the present claims recite "consisting" of lyocell, and thus does not encompass FR coated substrate fibers. The applicants' representative also discussed that Kelly cites US4750443 and US478065 only in the background section and actually teaches away from them. The Examiner indicated that Kelly was relied upon for teaching that hydroentangling is known in the art. The Examiner also indicated that presenting evidence at the specificity of some of the dependent claims in combination with evidence that this specific claimed range yields unexpected results may overcome Mater. No agreement with respect to the allowability of the claims was reached during the interview.

Response to New Grounds of Rejection – 35 U.S.C. §103(a) Obviousness Rejection Based on Mater et al., Kelly et al., and Rearick et al.

Claims 5-16 have been rejected as being obvious under 35 U.S.C. §103(a) over Mater et al. (WO 2003023108 referenced as U.S. Pat. Appln. Publ. No. 2004/0198125 A1) in view of Kelly et al. (U.S. Pat. Appln. Publ. No. 2002/0004348 A1) and Rearick et al. (U.S. Pat. No. 6,491,727). The applicants respectfully traverse.

The Examiner states in the most recent Office Action that Mater teaches flame retardant modified viscose rayon and viscose rayon is a regenerated cellulose fiber and is equated with a lyocell fiber. Based on that assertion, the Examiner urges that it would have been obvious to one of ordinary skill in the art to substitute the flame retardant treated viscose rayon fiber of Mater with a non flame retardant treated viscose rayon fiber such as lyocell.

The present independent claims 5 and 6 have been amended to further clarify that the fiber blend of the first nonwoven layer consists lyocell and modacrylic fibers and the fiber blend of the second nonwoven layer consists consists of lyocell, modacrylic, and para-amid fibers. A fiber that *consists* of lyocell fiber does not encompass a coated fiber, such as a lyocell fiber coated with a topically applied fire resistant material.

Referencing paragraph [0014] of Mater et al., the reference teaches away from including para-aramid fibers in hydroentangled nonwoven spunlace flame barriers because they "impart a yellow color to the flame barrier and negatively affect the look of the composite article". "A

reference may be said to teach away when a person of ordinary skill, upon [examining] the reference, or would be led in a direction divergent from the path that was taken by the applicant." *In re Gurley*, 27 F.3d 551, 553, 31 USPQ2d 1130, 1131 (Fed. Cir. 1994). Although Mater et al. includes para-amids as an option amongst the listed Category 1 fibers ([0023], [0068]), Mater et al. does not illustrate the use of these fibers nor does it teach a solution for solving the yellowing problem associated with those fibers. Unlike Mater et al., the present invention provides a solution to the yellowing problem otherwise associated with para-amid fiber that uses a multi-layered fabric configuration that still includes para-amid fiber (in one layer), but also lyocell and modacrylic (but not para-amid) in a separate adjacent masking layer thereto. In this manner, the present inventors have discovered a composite two-layered nonwoven construct that successfully yields combined properties of charring instead of melting, structural integrity maintenance, and masking of para-amid-induced yellowing.

The applicants further point out that neither Mater et al. itself, nor the industry of technical relevance, considers lyocell and the viscose rayon taught by Mater et al. to be equivalent.

Mater et al. does not disclose use of viscose rayon *per se*. Instead, Mater et al. teach use of viscose rayon as a composite fiber such as flame retardant (FR) viscose rayon (such as "LENZING FR") or Visil® fibers ([0068], [0070], [0202]). In particular, Mater et al. describes an embodiment in which 30-40% Visil® fibers and 30-40% melamine fibers as category 1 fiber is optionally combined with category 2 fibers such as 10-40% (e.g., 20%) modacrylic fibers. As expressly explained in Mater et al. (see paragraph [0201]), Visil® fiber is viscose rayon based fiber containing *33% aluminosilicate modified silica*). Viscose rayon based fiber containing 33% aluminosilicate modified silica clearly is not the same as lyocell fiber.

Lyocell is entirely an organic material, such as explained in an attached copy of trade literature entitled "TENCEL®-FIBERSTORY THE NEW AGE FIBER" of Lenzing, a commercial manufacturer of both viscose rayon and lyocell (e.g., see p. 5). A copy of this article was also provided to the Examiners at said interview. Further, even pure viscose rayon is recognized in the art as being different from and non-equivalent to lyocell. The applicants are also appending additional copies of trade literature as attachments to this response, which also were presented at said interview, which include the "Lyocell/Tencel: Facts behind the Fiber" (LotusOrganics) article. This article explains that lyocell is made by a fundamentally different

process than conventional cellulosic fibers such as viscose rayon, in that lyocell is made by direct solvent spinning with an organic solvent. As also explained in the two above-referenced literature articles, lyocell has a natural tendency to fibrillate or "pill" which significantly effects its properties and performance, and which differentiates it from viscose rayon. Thus, lyocell is different structurally from viscose rayon. The additionally attached copy of the Lenzing article on "Viscose" also explains that viscose is a "first generation cellulose fiber", unlike lyocell referred to as a "new age fiber" in the other attached Lenzing article. Thus, the substitution of lyocell for Visil®, FR viscose rayon, or viscose rayon *per se* would not be expected to yield predictable results by persons of ordinary skill in the art, in view of their significant chemical, compositional and structural differences. Further, there would have been no reasonable expectation of success for substituting lyocell for the Visil® type viscose rayon or FR viscose rayon fibers actually disclosed in Mater et al.

The Examiner also acknowledges in the most recent Office Action that Mater differs from the current application as it fails to teach hydroentangling layers together. However, at page 7 of the most recent Office Action, the Examiner urges that Kelly incorporates by reference US 4,750,443, which discloses three to seven nonwoven layers are hydraulically needled to one another and discloses US 4,748,065, which teaches a spunlaced fabric formed of NOMEX fibers that include laminates of spunlaced outer layers of NOMEX fibers. The applicants point out that Kelly merely refers to US 4,750,443 and US 4,748,065 in the "Background of the Invention" section of the reference, and, furthermore, teaches that these references provide unsatisfactory results (see, paragraph [0001], last two sentences). As a discovery identified in the reference, Kelly teaches that hydroentanglement should instead be applied to a nonwoven fabric formed from a blend of melamine and aramid fibers (see, e.g., [0015]-[0016]). That combination of fibers is not relevant to either nonwoven layer of the fabric recited in present claims 5 and 6. Kelly et al. therefore fails to teach, suggest or predict the success of hydroentangling together layers containing lyocell and modacrylic fibers.

With respect to Rearick et al., the Patent Office's attention is directed to Rearick et al.'s remarks at col. 3, lines 3-5 stating:

"*Testing has shown that flame retardant low melt fiber used in the yarn is not effective.*"

The applicants point out that it is well-known in this field of endeavor that modacrylics have a low melting point, e.g., about 370 to 410°F. Therefore, Rearick et al.'s invention is actually directed to a composition for reducing flammability of a cellulosic substrate, and requires application of flame retardant (FR) coating, such as a crosslinking agent and optionally one or more phosphorus-based compounds, to the cellulosic substrate fibers (see, e.g., col. 4, lines 48-60). The fire retarding composition is topically applied to the cellulosic substrate, or the fiber or yarn constituents thereof (col. 11, lines 8-10; col. 12, lines 10-20). The resulting composite cellulosic fiber is "fire resistant" (co. 5, line 20). Rearick et al. defines "flame resistant" as referring to the *treated* cellulosic substrate, i.e., as treated with the composition (col. 6, line 61).

Therefore, it can be appreciated that Rearick et al. requires a *topical* treatment of the cellulosic fibers, such as cotton, to impart the desired fire resistance, wherein the applied topical treatment requires performance enhancing additives and or crosslinking agents that bind to the cellulose. For example, the cotton fiber referenced in claims 5 and 8 of Rearick et al. is a substrate fiber that is coated with a flame-retardant coating, as stated in parent claim 1 of the patent. Similarly, the other cellulosic substrate fibers that are also mentioned in Rearick et al. at col. 4, lines 61-63 are also taught to be topically coated with a flame retardant coating.

The "consisting" language in present claim 5 and 6 thus distinguishes the materially different fiber materials taught by Rearick et al. That is, the *coated* FR fibers of Rearick et al. are not natural lyocell fibers.

Claim 8 of Rearick et al. merely indicates that the substrate fiber to be coated with flame retardant material can be *a blend* of cotton fiber and another fiber listed as modacrylic, rayon, or lyocell, etc. Both the cotton fiber and the "another fiber," such as lyocell, of that fiber blend would be FR coating treated in accordance with the instructions of Rearick et al. Thus, claim 8 of Rearick et al. does not teach or suggest cotton fibers *per se* can be substituted with lyocell *per se* in flame retardant barrier materials, as suggested in the Examiner's interview summary of December 9, 2008 and most recent Office Action.

As can be appreciated, Rearick et al. is attacking the problem of imparting flame retardancy to a cellulosic based substrate from an entirely different direction than the present invention. Amongst other differences, the product of the present invention does not require any fire retardant topical treatments of the substrate. The cost and additional processing requirements associated with applying an extraneous crosslinking FR finish to cellulosic fibers of the substrate, as required by Rearick et al., are avoided in the present invention.

Therefore, when properly read in context, and as a whole, Rearick et al. *teaches away* from including and relying on a combination of non-FR coated lyocell and low melt fibers *per se*, such as modacrylic fibers, to impart flame retardancy to the cellulosic substrates. Nor does Rearick et al. teach or suggest the multi-layered construct as presently claimed in which para-amid is used in one layer only to impart structural integrity and stability while enabling its yellowing to be masked by an adjoining layer.

With respect to present dependent claims 7-12, the combined teachings of Mater et al., Rearick et al. and Kelly et al. references do not teach all the recitations of present claims 5 or 6 with respect to the specified blends of non-flame-resistant-coated fibers and proportions thereof in two adjoining nonwoven layers as presently recited. Thus, it would not have been obvious to one of ordinary skill in the art to attempt to optimize teachings of Mater et al. in view of Rearick et al. and Kelly et al. to somehow arrive at the presently claimed fiber blend proportions recited in any of present claims 7-12.

With respect to present claims 13,14, 17 and 18, Mater et al. does not teach, suggest or predict success in solving yellowing discoloration of para-amid fiber in one nonwoven layer of a multi-layered flame retardant barrier material by providing an adjoining masking and charring layer having a significantly *lower* basis weight, such as recited in present claims 13, 14, 17 and 18. This result and performance of the fabrics of the present invention would not have been predictable or expected from the prior art of Mater et al., Rearick et al. and Kelly et al.

At page 6 of the most recent Office Action, the Examiner also referenced US 4,996,009 to Cooke et al. as teaching that modacrylic fibers form a char which closes pores of the woven fabric and prevents flame or hot gases from penetrating through.[1] The applicant points out that Cook et al. teaches a fire-resistant laminate that requires a combination of a *single* flame barrier fabric overlying an underlying *flammable* layer, such as a polyurethane foam layer. In the present claims 5 and 6, both the first and second nonwoven layers are fire-resistant. Cooke et al. teach that the single flame barrier fabric is formed of corespun yarns comprising a core of a flame resistant fiber, such as glass or polyaramids such as Kevlar® or Nomex®, and a sheath of modacrylic intumescent staple fibers, which can be blended with a fiber selected from wool, silk or cellulosic fibers. Unlike Cooke et al., the present invention provides a solution to the yellowing problem otherwise associated with para-amid fiber that uses a *multi-layered* flame-resistant fabric configuration that still includes para-amid fiber (in one layer), but also *lyocell* and modacrylic in two layers of the configuration inclusive of the one containing the para-amid fiber.

In view of the above, the relied upon Mater et al., Kelly et al. and Rearick et al. (and Cooke et al.) references for this rejection, either individually or in the proposed combination, fail to teach or suggest every claimed recitation of either present independent claim 5 or 6. Present claims 7-18 are patentable over the Mater et al., Kelly et al. and Rearick et al. references for at least the same reasons as their respective parent claim.

Therefore, the present claims are not rendered *prima facie* obvious over these references.

In view of the above, reconsideration and withdrawal of this rejection is requested.

It is believed that this application is in condition for allowance, and notice of such is respectfully requested.

[1] M.P.E.P. § 706.02(j)("Where a reference is relied on to support a rejection, whether or not in a minor capacity, that reference should be positively included in the statement of the rejection. See *In re Hoch*, 428 F.2d 1341, 1342 n.3 166 USPQ 406, 407 n. 3 (CCPA 1970)").

If the Examiner believes that a teleconference would be useful in expediting the prosecution of this application, then kindly contact the applicants' undersigned representative of record.

Respectfully submitted,

/Ramon R. Hoch/
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Attachment: (trade literature articles (3))